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APPLICATION OF INTERACTIVE LEARNING MACROMEDIA FLASH ON HUMAN MOTION SYSTEM MATERIAL TO IMPROVE LEARNING OUTCOMES

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Abstract

This study aims to describe the implementation, student activities, learning outcomes and student responses to the material system of human motion. This type of research is an experimental quantitative descriptive method with one group pretest-posttest design research design with replication. The target of this study was 8th grade of SMPN 2 Menganti. The instruments used are implementation observation sheets, student activity sheets, student test results sheets, and student response questionnaires. Data collection techniques are validation, questionnaire, observation, and pretest and posttest. Methods of data analysis are quantitative and qualitative statistics. The results showed (1) the mode of learning implementation in grade 8-A and 8-F of 1st meeting and 2nd meeting were very good. (2) student activities towards the application of Macromedia flash interactive learning media on average shows positive activities in working on LKS and discussions with macromedia flash interactive learning media. (3) Student learning outcomes in understanding the concept are very well proven by the increase in the N-gain score in the grade 8-A and 8-F, respectively 53.1% and 71.9%. (4) The response of students on average results gets very good categories in grade 8-A 95.2% and grade 8-F 95.4%. The conclusion of this study is the application of Macromedia flash interactive learning media to the material of human motion systems can improve learning outcomes for students of 8thgrade of Menganti 2 Junior High School.

***Keywords**: Macromedia flash, learning outcomes, human motion system.*

INTRODUCTION

Education is a human effort to improve and change resources in life, namely the younger generation becomes more qualified. According to Law No. 20 of 2003 concerning the National Education System states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious-spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, community, nation education system (Sanjaya, 2016). National education system must always be improved so that the quality of human resources increases and the country progresses.

Efforts to improve the quality of education aiming at perfecting the mindset, strengthening curriculum governance, deepening and expanding material, strengthening learning processes, and adjusting the learning burden to ensure the compatibility between what is desired and the government issued the 2013 curriculum. done to prepare the young generation to become individuals who are faithful, productive, creative, innovative, effective, and able to contribute to life. In the 2013 curriculum, the learning of Natural Sciences was carried out interactively, fun, and motivated students to learn, as well as increasing the effectiveness of competencies achieved (Kementrian Pendidikan dan Kebudayaan Republik Indonesia, 2016). Interactive learning causes interaction between students and educators, students with learning resources and learning environments.

The curriculum objectives include 4 competencies namely, (1) spiritual attitude competence, (2) social attitudes, (3) knowledge, and (4) skills. This competency is achieved through extra-curricular, co-curricular, and/or extracurricular learning. The formulation of the competency of spiritual attitudes and competencies of social attitudes is achieved through indirect teaching (indirect teaching), namely exemplary, habitual, and

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school culture by paying attention to the characteristics of subjects and the needs and conditions of students. Growth and attitudinal competency development are carried out throughout the learning process and can be used as a teacher's consideration in developing the character of student in the classroom (Kementrian Pendidikan dan Kebudayaan Republik Indonesia, 2016). The formulation of knowledge competencies and skills competencies are achieved through direct teaching. The direct learning process is the process of students developing students' abilities and thinking skills through direct interaction with learning resources. Based on Minister of Education and Culture No. 103 of 2014 in the direct learning process students use scientific education by carrying out 5M activities namely observing, asking questions, gathering information/trying, reasoning/ associating, and communicating (Kementrian Pendidikan dan Kebudayaan Republik Indonesia, 2014). Natural Knowledge is a science of nature which is obtained in a systematic way, which contains facts, concepts, principles, and discoveries (Kementrian Pendidikan dan Kebudayaan Republik Indonesia, 2006). Natural science education is expected to be a means for students to learn about individuals and the surrounding environment which will be applied in daily life. Science requires students to search everything systematically and scientifically so that students themselves find answers to curiosity, explore, understand the environment, not just fix on concepts and principles. Thus students become more in-depth about the material because science learning aims to develop a sense of curiosity, positive attitude, and awareness of the reciprocal relationship between science, environment, technology, and society (Kementrian Pendidikan dan Kebudayaan Republik Indonesia, 2006). One of the materials learned in science subjects in junior high schools is a motion system in humans.

Humans' motion system material is taught to 1st semester in 8th grade of junior high school. Based on the results of the pre-study conducted at Menganti 2 Junior High School, the researcher obtained the value data from the science teacher that at least 36% of students in each class had test scores under the minimum standarts and there was one class that 79% of students had grades below the minimum standarts for the material. The solution to finding out the cause of the problem is interviewing the teacher who teaches science in the class.

Learning media is needed to help realize a learning goal so that the media must be appropriate to facilitate students in understanding the material, especially the material of motion systems in humans. According to Sadiman et al. (2010), learning media is anything that can be used to deliver the material so that they can stimulate students' thoughts, feelings, interests, and concerns in such a way that the learning process occurs. The media used in the teaching and learning process must be interactive because in the learning process requires interaction between teacher and students.

In the learning process, students should play an active role in the learning process and the teacher acts as a facilitator or mentor in learning so that the learning process is interactive and conducive, therefore an interesting learning media is needed so that the learning process is not boring. Learning media that is capable of displaying text, images, sounds, videos or animations is including multimedia. Multimedia functions as a tool to channel messages in the form of knowledge, skills, and attitudes (Efrina, Nelly., Rachman, Fuad Abd., 2012). Learning using multimedia is expected to create a constructivist approach to student learning by making students active participants and building their own knowledge. Multimedia that is considered suitable to overcome this problem is interactive multimedia. This interactive media is a media that has various elements, namely elements of text, image, sound, video or animation so that it is included in multimedia and is expected to facilitate students in understanding the motion system material in humans.

Some studies show the effectiveness of learning using interactive learning multimedia including research conducted by (Citrasukmawati, Alfina., Raharjo, 2012), in her research showing that science learning devices with the display of Macromedia flash interactive learning media are effective in improving student learning outcomes. In addition there is also (Cahyadi, 2014), who in his research showed that flash-based science learning media can improve student learning outcomes.

In this research, the researcher applied from the development of previous research by (Priyonggo, 2018), with the title "Development of Interactive Learning Media Based on Macromedia Flash for 8th grade in "Humans' Motion Systems", the study was conducted at Sidoarjo 3 Junior High Schools and in this study researchers could conclude that media developed is interactive learning media based on Macromedia flash for the material of 7th grade human motion systems said to be worthy of being used as a learning media. The feasibility is based on 3 aspects, namely Validias or validity which obtain a feasibility percentage of 92.31% with very feasible criteria. Then the practicality of learning media in terms of learning comprehension obtained a percentage of 95.83% with very good criteria and supported by positive student activities when learning took place. The last criterion is the effectiveness of the use of instructional media in terms of student learning outcomes on the knowledge aspect with a posttest completeness percentage of 100% and obtaining an N gain of 0.76. Based on these results this

study is said to be very effective in improving student learning outcomes, therefore the researcher will apply the research to other subjects, in this case Menganti 2 Junior High School, and is expected to overcome problems and can improve learning outcomes.

Based on the various considerations above, then to overcome the gap that occurs between expectations and facts in learning researchers conduct research with the title "Application of Interactive Learning Macromedia Flash on Human Motion System Material to Improve Learning Outcomes".

METHOD

This research aims to describe the response of students after the implementation of learning by applying Macromedia flash through data obtained from student response questionnaires. The questionnaire analysis of student responses in this study used the Guttman scale. The assessment criteria for the value of student responses to the application of Macromedia flash are as follows.

Table 1 Guttman scale score criteria

Answer	Score
Yes	1
No	0

(Riduwan, 2010)

The formula used in the calculation to obtain the percentage is as follows;

$$\text{Percentage (\%)} = \frac{\textit{the number of students who answered "yes"}}{\textit{number of all students}} x\ 100\%$$

he results of the student response questionnaire analysis were used to determine the implementation of macromedia flash implementation and can be interpreted using the score interpretation criteria as follows;

Tabel 2. Interpretation criteria for student responses to the application of macromedia flash

Average Score (%)	Criteria
0-20	Not practical
2-40	Less practical
41-60	Quite practical
61-80	Practical
81-100	Very practical

(Riduwan, 2010)

RESULTS AND DISCUSSION

Student response data in this study was taken from the response questionnaire in which there were 15 items of statements about learning using the application of Macromdia flash. As for the results of the student, response recapitulation can be seen in table 3.

Table 3 recapitulation of data from student response questionnaires

No	Statement	Student Response (%)			
		VIII-A		VIII-F	
		Yes	Cri-teria	Yes	Cri-teria
1.	Macromedia flash-based interactive learning media for motion system material in humans is a new thing for me	100,00	Very Good	100, 00	Very Good
2.	Macromedia flash based interactive learning media for motion system material in humans makes learning atmosphere pleasant	81,25	Very Good	81,2 5	Very Good
3.	Media on macromedia flash-based interactive learning for motion system material in humans is interesting because there are available material, image, audio, video and animation texts.	100,00	Very Good	100, 00	Very Good
4.	Macromedia flash-based interactive learning media for motion system material in humans can enhance my enthusiasm for learning	87,50	Very Good	93,7 5	Very Good
5.	Macromedia flash-based interactive learning media suitable for motion system material in humans	100,00	Very Good	100, 00	Very Good
6.	Language used in macromedia flash-based interactive learning media for motion system material in humans is easy to	87,50	Very Good	81,2 5	Very Good

No	Statement	Student Response (%)			
		VIII-A		VIII-F	
		Yes	Cri-teria	Yes	Cri-teria
	understand				
7.	Interactive learning media based on Macromedia Flash makes it easier for students to learn the material of humans' motion system material	100,00	Very Good	100, 00	Very Good
8.	After the macromedia flash-based interactive learning media is used in human motion system material, students can explain skeletal and muscle function in humans	100,00	Very Good	100, 00	Very Good
9.	After the macromedia flash-based interactive learning media is used in the material of the human motion system, students can identify various types of bone in humans	100,00	Very Good	100, 00	Very Good
10	After the macromedia flash based interactive learning media is used in the material of the human motion system, students can identify the various joints in humans	100,00	Very Good	100, 00	Very Good
11	After interactive learning media based on macromedia flash are used in human motion system material, students can identify various types of muscles in humans	100,00	Very Good	100, 00	Very Good
12	After the interactive learning media based on macromedia flash are used in human motion system material, students can explain how the biceps and triceps work in humans	84,38	Very Good	87,50	Very Good
13	After the interactive learning media based on macromedia flash is used in the material of the human motion system, students can find out the various types of motion system disorders in humans	87,50	Very Good	87,50	Very Good
14	After the interactive learning media based on macromedia flash is used in the material of the human motion system, students can find out the efforts to maintain the health of the motion system in humans	100,00	Very Good	100, 00	Very Good
15	Students can sharpen their understanding of the motion system material in humans after using macromedia flash-based interactive learning media	100,00	Very Good	100, 00	Very Good

Based on the results of research on students' responses to the application of Macromedia flash interactive

learning media to human motion system material, see Table 4.11. The responses of grade 8-A students were 95.21% with very good categories and grade 8-F 95.42% with very good categories. The statement that most dominates the 15 statements is statements number 1, 3, 5, 7, 8, 9, 10, 11, 14 and 15 which get a percentage of 100%.

Statement number 1 about macromedia flash-based learning media is new for students, getting 100% presentations in both classes. This percentage proves that the majority of students are still new to macromedia flash-based learning media especially for human motion system material. This flash media is included in the multimedia in which there are various elements. According to (Daryanto, 2013) multimedia has characteristics that consist of a combination of audio and visual elements, are interactive, and are independent or in other words users can use media without the guidance of others. According to the statement above multimedia is interactive, this statement relates to question number 2.

In statement number 2 which states that macromedia flash-based interactive learning media for human motion system material makes learning environment pleasant, obtains a percentage of 81.25% in both classes with very good criteria. This statement relates to a pleasant learning atmosphere. This statement number 2 has a connection with statement number 4, which increases students in learning who get a positive response with a percentage of 87.50% in grade 8-A and 93.75% in grade 8-F, both included in the excellent category. The connection between the media and the enthusiasm for learning or student motivation is very close, this is following with the statement of (Sudjana, 2014), which states that by using media, learning will be more interesting and able to foster student motivation.

Macromedia flash-based interactive learning media for motion system material in humans is interesting because there are text, material, images, audio, video, and animation available. This statement is the number 3 statement with a positive response that has a percentage of 100% and has a very good criterion. This is supported by the statement of (Himmah, 2017), who showed that interactive multimedia is an attractive medium to get a positive response of students by 100% with very decent. This statement number 3 is closely related to statement number 5.

Statement number 5 states about the suitability between the media used with the material of motion systems in humans where they get a 100% percent in both grade 8-A and 8-F with very good criteria. Submission of material through learning media will be effective if delivered in easy-to-understand language. This statement number 5 and 6 has the ability that is the ease of language used to convey the material system of human motion, this statement number 6 gets the results of a percentage of 87.50% in grade 8-A and 81.25% in grade 8-F with very good categories in both grade. According to (Arsyad, 2014), media is interpreted as graphical, photographic and electronic tools in receiving, processing, and reconstructing visual and verbal information. Based on this statement, the media can also be interpreted as an intermediary in gaining knowledge, so that the media can be effective if the language used is easily understood language.

Statement number 7 states that flash-based interactive learning media can make it easier for students to study human motion system material and get a percentage of 100% in both classes with very good categories. The language that is good and correct and easy to understand is an important factor in flash-based interactive learning media for easier learning.

Statement number 8, 9, 10, 11, 12, 13, 14 is a statement relating to the material system of human motion, specifically the sub-material. Statements number 8, 9, 10, 1, and 14 obtain preset in both classes of 100% per number with very good criteria. Statement number 12 grade 8-A obtained a percentage of 84.38% grade 8-F obtained a percentage of 87.50%, both of which included very good criteria. Statement number 14 grade 8-A and 8-F obtain the percentage results with the same amount of 87.50%. Statements number 8, 9, 10, 11, 12, 13, and 14 are closely related to statement number 15 that students can hone understanding of the human movement system using interactive learning media based on macromedia flash, get a percentage of 100% with very good criteria.

Overall students give a positive response to the application of macromedia flash interactive learning media, helping students more actively and easily understand the material in the learning process of students, so that the learning outcomes can be seen in improving learning outcomes. This shows that this application effect on improving learning outcomes. Students feel happy about learning and students become active in finding concepts in the material systems of human motion. As for the points that do not get a 100% percent because there are students who are less accustomed to operating a laptop, one reason is fear of being damaged. The average of all the percentages of the statements for grade 8-A is 95.21% and grade 8-F is 95.42% both are included in the criteria very well criteria. These results prove that macromedia flash-based interactive learning media for human motion system material receive positive responses from students.

CONCLUSION AND SUGGESTION

Conclusion

Based on the results of the research that has been done it can be concluded that the response of students after using macromedia flash-based interactive learning media on human motion system material can be categorized as very positive because each statement on the student response questionnaire obtained a value of ⩾61, so this interactive learning media was considered practical to implement.

Suggestion

Based on the research that has been done, there are a number of suggestions from researchers, namely as follows: (1) If the researcher wants to apply this research, it is better to consider the time to conduct research, so that the time spent is not too long or too short and coordinates with the school activity schedule; (2) it should be noted for researchers, that is, adding components to the macromedia flash interactive learning media part of the learning material; and (3) In further research, researchers are expected to be able to consider the availability of equipment that supports research, so as not to hamper research.

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